Factors Disrupting a Successful Implementation of E-Commerce in Iraq

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الخلاصة:

أضحت التجارة الالكترونية تمثل حافزاً ضرورياً وعموداً هاماً من أعمدة الاقتصاد التي تستند عليها أيٌ من الدول المتحضرة، إضافةً الى مساهمتها في توفير أسواقٍ جديدةٍ للمستهلك مغايرة لأسلوب التجارة التقليدي. فيما يتعلق بالعراق، فإنه مازال بعيداً عن الاستخدام الصحيح والأمثل لهذا التقنية لعدة أسباب منها ما يتعلق بالبنية التحية للتكنولوجيا ومنها ما يتعلق بقلة الايدي الخبيرة في تطبيقات تقنيات المعلومات، إضافةً الى أسباب اقتصادية وأخرى سياسية الخ، مما يتطلب تحركاً سريعاً وفعالاً وعلى جميع المستويات الحكومية لغرض اللحاق بركب الدولة الأخرى السابقة في هذا المجال.

Abstract- **In the emerging global economy, e-commerce has increasingly become a necessary component of business strategy and a strong impulse for economic development.**

One of the most significant developments in business in recent years has been the increasing use of e-commerce. It has revolutionized many marketplaces and started opportunities never imagined before.

Businesses that are not investigating the use of e-commerce are in a great danger of finding themselves being overtaken by others who are utilizing this technology.

Iraq is characterized as one of the very few countries in the world that are still so far from the real use of inevitable services of e-commerce.

Primarily, Iraq suffers from a number of features that work as barriers to an effective use of e-commerce in life such as the lack of awareness and understanding of the benefit of e-commerce, the lack of information and communication technologies (ICT) knowledge and skills, the unstable physical network infrastructure, security and other privacy-related problems in addition to problems related to costs for the adoption of a new technology.

Senior leaders of the country must be aware of these emerging, and increasingly complex environments of e-commerce in order to compete on a global (or even on a regional) level.

The purpose of this study is two-fold. First, it seeks to investigate the hindrances to e-commerce adoption in Iraq. Second, it seeks to suggest some recommendations for successful applying of e-commerce. The work begins by examining e-commerce, its advantages, its challenges and market models of e-commerce. The remainder of this paper is structured as follows: In the next section, a typical implementation of e-commerce is given, followed by the barriers to e-commerce adoption in developing countries and then barriers to its adoption in Iraq. Later, the conclusions and recommendations are presented and the paper is finalized with limitation of study and future work.

Keywords- E-commerce; E-commerce Adoption; M-Commerce; Internet; E-readiness; Developing Countries; Arab World; Iraq; Impediments; Security; ICT; Information Technology.

I. INTRODUCTION

It is particularly noteworthy that there is a scarcity of studies focusing on the use of e-commerce in the context of Iraq (with only few exceptions, such as in [28] where the author tried to propose strategies that could enable south of Kurdistan region to become an active participant in the digital economy). Due to the lack of studies on Iraq (which is attributed to the difficulties surrounding conducting such studies), we had to make use of studies that addressed the Arab world, since the Arab countries are similar in many ways including religion, customs and values, history, and language.

In some cases, we had to make use of studies devoted mainly to developing countries (since the Arab world constitutes a part of this larger circle). For example, studies such as [7] and [3] tried to assess the performance of e-commerce markets in Saudi Arabia, while [49] tried to address the barriers of e-commerce adoption in Egypt, in addition to studies that considered e-commerce implementation in UAE, Iran, Jordan and other countries.

Thus, the present study attempts to bridge the knowledge gap in the extant literature about e-commerce adoption and diffusion in Iraq.

A. Definition

E-commerce is usually define as the use of electronic communications and digital information processing technology in business transactions to create,

transform, and redefine relationships for value creation between or among organizations, and between organizations and individuals [8].

Three key infrastructure developments that contributed to the rapid diffusion of e-commerce: the Internet, the World Wide Web and protocols (such as secure HTTP) that forms as a mechanism for making an offer to complete a transaction in a secure environment [10].

E-commerce uses the Internet to build and simplify relationships with consumers, partners and other businesses. This involves the electronic processing of orders, handling customer service and cooperating with business partners. Key principle in e-commerce is that business is done without any direct physical contact.

B. Advantages

The advantages of e-commerce can be classified in two main categories: tangible and intangible. Tangible benefits include business efficiency, increased automation of processes, transformation of traditional market chain, retained and expanded customer base, reduced operation costs and acquisition of a niche market. Intangible benefits include enhancing well-being and education of customers, consumer loyalty, competitive advantage and convenient shopping [21].

From the top-management point of view, the benefits of e-commerce in the Arab world countries can be summarized in providing a faster service to customers, providing an easier service to customers, providing a more reliable service to customers, creating new markets, improving the competitive position, reducing operational costs, improving the image, reducing administrative costs, meeting customers' demand for the service and reducing the workforce [2].

C. Challenges

E-commerce challenges are classified mainly as: technological, managerial, and business related. Technological challenges include security, web site issues, and technology issues (issues that encompass costs, software and infrastructure). Managerial challenges include people and organizational issues, and obtaining senior management backing. Business challenges include customer service, customers' old habits and legal issues [21].

We will consider, later, the challenges to a good implementation of e-commerce, first in developing countries and then in Iraq.

D. E-commerce Market Models

We can identify five major types of e-commerce market models: business-to-business (B2B); business-to-consumer (B2C); business-to-government (B2G); consumer-to-consumer (C2C); and mobile commerce (m-commerce) [20]:

- *Business to- Consumer (B2C)*: It is commerce between companies and consumers, involves customers gathering information; purchasing physical goods like books or travel or information goods like downloadable digitized material content, such as software, music or electronic books (As an example: Amazon.com)
- *Business-to-Business (B2B)*: This type involves the use of e-commerce in between and among businesses. B2B area is nowadays growing much faster than B2C and about 80% of the e-commerce is of this type.
- *Consumer-to-Consumer (C2C)*: This type of e-commerce occurs between private individuals or consumers (examples include eBay.com)
- *Business-to-Government (B2G)*: This type involves commerce between companies and the public sector. Examples include the use of the Internet for licensing procedures, public procurement, and other government-related operations.
- *Mobile Commerce (m-commerce)*: This is defined as a process of buying and selling of goods or services through wireless methods. The development of mobile phones, PDAs and the roaming technology has made the use of m-e-commerce services independent of location.

II. IMPLEMENTATION OF E-COMMERCE

According to [20], for e-commerce to be a good alternative to traditional commercial transactions and for a business to maximize the benefits of e-commerce, a number of issues have to be considered. A typical e-commerce transaction loop involves the following six major players and their corresponding requisites:

- *The Seller* who should have a corporate web site with e-commerce capabilities, a corporate intranet and IT-literate employees to manage the information flow and maintain the whole e-commerce system.

- *The Transaction Partners* that include banking institutions which offer transaction clearing services, national and international freight companies to enable the movement of physical goods and authentication authority that serves as a third party to ensure the integrity and security of transactions.
- *Consumers* who form a critical mass of the population with access to the Internet and possess a mindset for purchasing goods over the Internet rather than the physical inspection of items.
- *Businesses* that together form a critical mass of companies with Internet access and the capability to place and take orders through the Internet.
- *Government* that should establish a legal framework governing e-commerce transactions (such as electronic documents, signatures etc.); and legal institutions that would enforce the legal framework (such as laws and regulations) and protect customers and businesses from fraud.
- *The Internet* that should have a robust and reliable infrastructure and a pricing structure that doesn't make penalty on consumers for spending time on and buying goods over the Internet.

For e-commerce to grow, these requisites and factors have to be in action. For example, a country with a very good Internet infrastructure will not have high e-commerce levels if banks in that country do not give support services to e-commerce transactions.

III. E-COMMERCE IN DEVELOPING COUNTRIES

The term 'developing countries' usually refers to the newly emerging and post-colonial economies of Africa, Asia, South America and Pacific regions and sometimes referred to as 'Third World', 'Less Developed States' or 'the Global South'. These countries are often associated with negative indices such as poverty, insecurity and instability [22].

According to [39], Iraq is considered among the developing countries along with countries such as Indonesia, India, Saudi Arabia, Turkey and Yemen. Countries such as USA, Canada, Japan, Germany and Belgium are considered developed countries.

A. E-Readiness Indicator

E-readiness, according to [45] means the ability to use information and communication technologies to develop one's economy and to foster one's welfare.

In terms of e-readiness, the highest-ranked areas of the world are North America, Western Europe, in addition to some countries in Asia. On the other hand, the bulk of the countries with lower levels of e-readiness are mainly found in developing and transition regions.

B. Impediments to E-commerce in Developing Countries

Previous research, according to [22] has found that developing countries have not derived the expected benefits from e-commerce. As a result, there is still doubt about how e-commerce will actually lead firms in developing countries to new trading chances.

Most developing country markets have not always been successful in adopting new technologies (such as e-commerce). Hence, studies that will uncover the reasons for the lack of acceptance and adoption in these countries is highly needed [23].

A number of factors have hindered the growth of e-commerce in developing countries: The lack of network security is considered to be the primary problem, followed by slow and unstable connections, the lack of technical skills and the of lack knowledge management on Internet (ICTs in general), the serious lack of confidence in e-commerce, the lack of information technology (IT) administrative systems and necessary experience, high costs and fees to start e-commerce by utilizing e-marketplaces in addition to the insufficient human resources and insufficient digital infrastructure. Also, B2B e-commerce may not offer greater returns to firms in developing countries than other channels for conducting trade [4].

Furthermore, according to [12], developing countries often lack the necessary financial, legal, and physical infrastructures for the development of e-commerce. Also, developing countries often have different cultures and business philosophies, which limit the applicability and transferability of the e-commerce models presented by developed countries.

IV. E-COMMERCE IN IRAQ

A. Iraq Facts and Statistics

Iraq is considered a western Asia country. Some facts about Iraq are as follows [29]:

- Population: 31.129.225 (as of July 2012)
- Location: Middle East, bordering the Arab Gulf, between Iran and Kuwait.
- Total area: 438.317 km^2.
- Border countries: Iran 1,458 km, Jordan 181 km, Kuwait 240 km, Saudi Arabia 814 km, Syria 605 km, Turkey 352 km
- Coastline: 58 km
- Natural resources: petroleum, natural gas, phosphates, sulfur.
- Irrigated land: 35,250 km^2 (2003)
- Natural hazards: dust storms; sandstorms; floods.
- Terrain: mostly broad plains; reedy marshes along Iranian border in south with large flooded areas; mountains along borders with Iran and Turkey
- Total renewable water resources: 96.4 km^3 (1997).

B. Impediments to E-Commerce in Iraq

Some countries are already benefiting from the results obtained from e-commerce (for example, e-commerce is rising at 12% annually in the U.S, and EU and it is expected that within few years the productivity gap between the EU countries and USA will close rapidly). These countries are now in apposition to benchmark their economies with competitors internationally [14].

As for [6], they argue that for many years, the Arab world countries have suffered of being isolated from the global online trading which influence the economic growth and development in these countries and that there are still uncertainties in the importance of e-commerce among customers in developing countries and the Arab world (including Iraq.) So, the benefits and use of Internet in these countries has not been realized in full.

A study conducted in [2] reveals that approximately 80% of the surveyed Arab consumers in the study have favorable intentions to e-shop sometime in the near future, and that approximately 67% of the same sample see that e-shopping is an easy way to use/carry out tasks, and approximately 65% of them are fully satisfied with the idea of purchasing products and services online.

We can sub-classify the impediments that prevent from a real implementation of e-commerce in Iraq as either global issues (the ones that still exist in the international economics) or issues that pertain to Iraq.

Issues pertaining to Iraq:

1. Technical Issues

Some of the obstacles include lack of credit cards and convenient payment means, poor distribution logistics, lack of specialized, trust-worthy online merchants of reasonable size, imperfect legal structure, and lack of large scale telecommunication transmission capacity.

1.1 Information and Communication Technology

Information and communication technology (ICT), is often used as an extended synonym for information technology (IT), but is a more specific term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audiovisual systems, which enable users to access, store, transmit, and manipulate information [46].

Infrastructure for IT services remains underdeveloped in most parts of the country, as IT access is limited and uneven. Education remains highly dependent on printed materials [36].

ICT has the potential to stimulate productivity growth, employment, human resources, skills and capabilities, knowledge-based economy which in turn promotes economic development.

Despite the recent growth in the demand for ICT, it has a very limited market in the Arab region, limited supply and low investments in comparison to the world total. It can be noticed that the diffusion of ICT in the Arab region is characterized by a market concentration in the Arab gulf countries and that there is a gap between the gulf countries and other Arab countries in terms of supply, demand, prices and intensity of services [24].

Iraq has no strong ICT infrastructure for supporting e-commerce practices, and according to [37], the country's ICT facilities and applications are very weak as most teachers have either very little or no ICT literacy at all, and thus are ill-suited to play their role to help create a new generation of ICT literate students. Also, the number of people owing personal computer is only 12% of the population [40].

Ref [24] explains the reasons behind the limited market and the low diffusion rate of ICT in the Arab world (including Iraq). These problems include:

- Inadequate investment and lack of infrastructure.
- Inadequate awareness of the importance of ICT in the new economy.
- Insufficient Research and Development (R&D) operations in ICT-related issues.
- Deficient services resulting either from low speed rate or disconnection.
- The lack of a network system minimizes the efficiency benefit of the services.
- Low demand by consumers, as a result of either the limited capacity/availability or limited efficiency of the services, or the high costs.
- Uncertainty/risk aversion on the supply side because deficient and limited demand discourage investments and expansion of the services.
- Poverty in some countries in the region restricts demand.
- Higher costs of the services discourage both demand and supply.
- Language problems caused by the preference for Arabic, or unfamiliarity with other languages, which reduces in the maximum benefit to be gained from the Internet, especially with regard to websites offered in other languages.

1.2 Telecommunication Infrastructure

E-commerce success depends strongly on a number of technology infrastructures. Telecommunication infrastructures are required to connect various regions within a country and across different countries. In the absence of an adequate basic infrastructure, it is possible that the desired advantages of the use of e-commerce become disadvantages.

1. *The Telephone Network*: The telephone network consists of fixed telephone lines that connect a subscriber's terminal equipment to the public switched telephone network and that have a port on a telephone exchange. Integrated services digital network channels and fixed wireless subscribers are included. The number of telephone lines in Iraq was reported at 1600000 in 2010, according to [35] report published in 2012. Unreliable telephone connections may result in narrow bandwidths offered by many ISPs, with consequent low connections. Also, the number of mobile and fixed-line telephone subscribers in Iraq, which was reported by [33] says that the number was at 18611300 in 2008. (Mobile and fixed-line subscribers are total telephone subscribers, fixed-line plus mobile).
2. The Internet Access: Iraq is a post-conflict society. There is wide usage of internet and mobile phone devices among younger generations in urban areas, but there is little penetration of these technologies into the greater economy [36].

The Arab world has been investing in building its communications infrastructure and adopting the use of the Internet since 1995 as a vital tool for development [5].

However; the Arab countries need to make many improvements in their basic Internet capabilities before reaching at least the current level of Internet performance existing in the advanced countries. In most cases, Arab governments, and for political reasons, try to create a monopoly in the ISP market by prohibiting new establishments from entering the market. Another reason why Internet costs are high and connection speeds are low in Arab countries is because Internet service providers are not allowed to provide their own international gateways [2].

The access to the Internet in Iraq is still very slow and expensive. It is also unreliable because of the poor telephone communications and the inadequate power supply, as the total production of electricity in Iraq by 2010 was 48.96 billion kWh against 55.66 billion kWh of consumption, with 6.7 billion kWh being imported from neighboring countries [18]. On average, households receive 14.6 hours of electricity daily, through a combination of the public network and private generators [40].

It was only in late 1999 that Internet access became available to the general public through limited Internet centers/cafes. The number of Internet users in Iraq was 800,000 in 2010 [32] or 325.000 users [16]. In June 2012, the number jumped to 2.211.860; however, this constitutes only 7.1% of the total estimated population of Iraq in 2012, which is 31.129.225 [16]. In a

country like China, which is the world leader in the number of Internet users, this number was 538.000.000 in June 2012 forming about 40% of the population of China in the same year, which is 1,343,239,923 [17].

The International Internet bandwidth (in Mbps) in Iraq was reported at 40 in 2008, according to the [31]. International Internet bandwidth is the contracted capacity of international connections between countries for transmitting Internet traffic.

Consumers' Internet knowledge such as the Internet usage skills, search functions, and search proficiency makes them more confident to take part in online transactions. Also, users who spend more time using the Internet would tend to obtain greater knowledge and understanding of the online systems [23].

According to [23], the majority of the Internet users in the Arab world are concentrated in the Gulf countries, whose population does not exceed 11% of the whole region's total population.

Ref. [5] has summarized the Internet barriers in the Arab world as follows:

- The inability to adopt this important project as a priority.
- The inability to initiate the distribution of access and to encourage the wide use of the Internet.
- The absence of mutual strategic cooperation to develop the use of the Internet between the Arab countries.
- Most Arab countries find it more difficult even to partially pay their contribution covering Internet fees.
- Ministries of Education and Higher Education in pay less attention to the training programs targeting teachers on how to use the Internet.
- The barrier of language.
- The absence of effective laws and legislations that govern the Internet use and e-commerce.
- Insufficient rewards that are given to organizations or individuals that show a desire to provide the Internet services.
- The absence of a private sector role
- The issue of user acceptance of a new technology.

3. *The Connection Cost*: Internet access prices are a key determinant of Internet and e-commerce use by individuals and businesses. Countries with lower access costs typically have a greater number of Internet hosts. The availability of a wide range of Internet connections and other communication services, at competitive prices, may affect users' decisions to adopt e-commerce and allows users to choose different and appropriate services according to their specific needs.
   The cost of the Internet access in Iraq makes it inaccessible to most users, as the monthly connection cost of the Internet represents a burden on a large portion of the population. According to [9], Iraq and Lebanon have the highest ADSL fees, while Morocco and Egypt have the lowest fees. The cost of Internet (6 Mbps, unlimited data, Cable/ADSL) in Iraq, according to [25], is about $50.76
4. *Broadband Connection*: Broadband connectivity is a key component in ICT development, adoption and use. It accelerates the contribution of ICTs to economic growth, facilitates innovation, and promotes efficiency. According to [30] published in 2012, the number of fixed broadband Internet subscribers in Iraq was just 77 in 2010 (Fixed broadband Internet subscribers are the number of broadband subscribers with a digital subscriber line, cable modem, or other high-speed technology). However, according to [42], by 2013, there was a total number of 108 broadband internet service providers in Iraq[1].

2. Social and Cultural Issues

The social and cultural characteristics of the people of Iraq and the concepts associated with online transaction pose a much greater challenge and act as a major impediment to the adoption and diffusion of e-commerce.

2.1 The Nature of Conducting Business

The success of doing business in many countries (including Arab world countries) depends strongly on the quality and quantity of personal relationships. Therefore; a typical company is usually not only a pure

[1] ISPs in Iraq include companies such as Cellnet, Itisaluna and the American University of Iraq, with Newroz being in position # 1 based on the Internet usage in Iraq.

economic component but a socio-economic one as well. A strong individual relationship and long term association between the parties provide a sense of community and later leads to economic engagement.

2.2 Language

Language has been identified as a socio-cultural impediment that hinders both the access to information and to the Internet and participation in e-commerce. A large portion of people in Iraq are illiterates, and uneducated people tend to have limited access to information on the web because information is usually in a language. The less educated and illiterate people cannot understand the languages that are used to disseminate information on the Internet.

The issue related to language is important because it is a gateway of information and knowledge transfer in the digital world. English is a primary language used in many Western countries where new technologies arise. It is the predominant language for development of IT and e-commerce and it is the main language used on the Web.

82% of Web sites are in English and that is a huge obstacle for Arabic speaking natives who can only write and read Arabic [14].

Familiarity with Basic English is found to be essential for using the Internet. This barrier, coupled with shortage of Arabic software, also contributes to the hesitation of Arab consumers [23].

In Iraq, the number of people who speak English (as a second language) constitutes about 35% of the population of Iraq in 2012, which is 31.700.000 [47].

The level of English language skills overall is low, even amongst educated professionals and academics. Some students have access to the Internet and personal computers at home. However, poor English language skills limit their access to English-language Internet sites and services. English language teaching and training at the university level is improving, but it is hindered by inadequate training, large class sizes, outdated teaching methodologies, and lack of proficiency amongst teaching professionals [36].

3. Social and Economic issues

It is necessary to deal with a number of socio-economic and regulatory impediments before Iraq can participate in electronic commerce. These impediments are:

3.1 Economic Situation

Since e-commerce depends on some technology infrastructures which are relatively expensive, it is unlikely under the current circumstances that Iraq can be involved in e-commerce. The Gross Domestic Product (GDP) and income per capita are common indicators for the economic situation of a country. For example, the unemployment rate in Iraq in 2010 was 15%, the inflation rate was 6% by 2011, the industrial production growth rate in 2010 was 4.8%, total external debt as of December 2011 was $45.29 billion, and population below poverty line in 2008 was 25% [18].

The cost of Internet access has dropped in recent years; however, it remains a significant barrier to e-commerce adoption.

3.2 Educational System

The poor state of educational system in Iraq is seen as impediment to e-commerce adoption, as the literacy rate of the Iraqi adults in 2009 was 78.06% [48] and [38]. It means that one out of five Iraqis between the ages of 10 and 49 cannot read or write a simple statement[2]. While Iraq boasted a record low illiteracy rate for the Middle East in the 1980s, illiteracy jumped to at least 20% in 2010 Further, illiteracy among women in Iraq, at 24%, is more than double that of men (11%) [15].

According to [36], books, periodicals, and magazines are highly prized and respected. Each college at a university has its own library for students in that discipline. Lending libraries do not exist, and most students cannot easily access the resources available on campus, most of which are old and outdated. Universities have limited Internet capacity, most university faculty does not have regular access to computers at work; computer labs for student use are inadequate and often non-functional. Many university faculty and staff lack basic computer skills and Internet experience. Outside of major urban centers, many academics and students do not have email addresses.

The lack of IT skills and business skills are widespread barriers to effective adoption of e-commerce. The lack of appropriate IT education is perceived to be a reason

[2] The United Nations defines an illiterate person as "someone who cannot, with understanding, both read and write a short, simple statement on his or her everyday life. A person who can only read but not write, or can write but not read is considered to be illiterate. A person who can only write figures, his or her name or a memorized ritual phrase is also not considered literate."

why the potential value of computers and the Internet as a means to participate in e-commerce is not appreciated. Mostly, school curriculum does not include computer education. There is a need for early computer education so that people could become computer literate in school. People would have to be trained and educated before they could benefit from the advantages offered to them by the Internet and e-commerce.

3.3 Payment System

The efficiency of the payments system can help or impede the development of e-commerce. A supportive electronic payments infrastructure is critical to promote e-commerce, which exposes a key link between e-commerce and the financial foundation of the economy.

In many developing countries, cash is still the preferred method of payment not only on account of security but also for the sake of anonymity, which is useful for tax evasion purposes or for keeping secret what person's money is being spent on [27].

Few people in Iraq have credit cards, as most banking sectors lack a national clearing system and potential customers are suspicious of being cheated. Full efficiency and realization of the benefits of e-commerce depends on rapid authorization, payments, and settlement of accounts. Iraq does not have financial institutions or central bank payments mechanisms that are ready for this task. Iraq credit cards are not yet popular in the domestic economy. Individuals mostly use these for making payments while traveling abroad. The Iraqi market is cash-dominated.

In countries such as Yemen and Iraq, there are still constrains on hard currency transfers and consumers will find it difficult to complete transactions and make payments online [23].

The low growth rate of the Iraqi credit cards industry is attributed to the following [13]:

- The lack of suitable infrastructure, such as POS terminals and internet connectivity.
- Credit card products are available only to a very small portion of Iraqi citizens.
- The regional set up, governed by Islamic laws, allows the use of credit cards but within certain conditions.

3.4 Transportation Network

E-commerce depends largely on the network of transportation within a country. Inadequacy in essential services such as postal service along with delivery required in an international transaction can demoralize the success of the transaction itself. Speed is one of the most important features of e-commerce. The inadequate distribution and burdensome delivery systems and the lack of good transport, and postal system are primary impediments to the growth of e-commerce in Iraq.

4. Social and Psychological Issues

4.1 Resistance to Change

Resistance to change is one of the most typical issues in any attempt to bring about technological change such as e-commerce). Corporate leaders are used to doing business in a certain way and they do not want to change, which represents a significant hurdle in itself [14].

4.2 Territorial Behavior

Corporate leaders usually exert territorial behavior, meaning that they want to have control over their business domain. They believe that if they were to engage in e-commerce, they would be losing control over the company assets [14].

4.3 Generation Gap

Many company managers do not use e-mail for the reason that they were not brought up in the information age. This fact is coupled with their mindset of reluctance to invest in IT and their failure to imagine the added value [14].

5. Political and Legal Issues

Government initiatives are important in the adoption of e-commerce and other ICT in general. No progress is possible in the absence of clear policies and the determined implementation of such policies. The lack of a policy to guide e-commerce expansion in Iraq is a major hindrance to the adoption of e-commerce. Also, other issues that are seen as impediments to e-commerce adoption are free trade, the monopoly which national governments exercise over national telecommunications, import duties on IT equipment like hardware and software. Changes in government policy are imagined as being crucial to creating an environment for the broad use of the Internet in many sectors of developing countries.

Complicated and unclear business rules form one of the most critical barriers toward e-commerce; one that exists in Iraq and in many developing countries. The government should try to encourage consumers

and corporations by developing a clear harmonious set of rules.

6. *Consumer Awareness*

Consumer awareness is a term used to describe the awareness of a potential or current buyer about a particular product or company. Consumer awareness can be as simple as a shopper remembering a television commercial or as specific as a customer delving into the manufacturing origins of a specific product [41].

7. Corporate Awareness

On the corporate level, the situation is not different from the consumer level; the private sector still ignores the importance of this point.

8. Economy's Performance

Iraq's economy is dominated by the public sector's activity with a limited role for the private sector. The oil sector provides about 95% of foreign exchange earnings [44].

At the consumer-to-consumer level, we can find two local well-known web sites that are dedicated to the electronic type of commerce, and these are: hrej[3] and mredy[4] that offer B2B services such as selling/renting vehicles, houses, electronic devices and others.

9. Lack of Certificate Authority

The nonexistence of a certificate authority (CA) serves as an impediment toward the adoption of e-commerce on a national level. Moreover, the form of this CA- whether private or government-owned - should also be determined [14].

Global Issues of E-commerce:

In addition to the issues that prevent from an effective implementation of e-commerce, which pertain specifically to Iraq, there are other issues that still form a barrier against more developed use of e-commerce in the whole world

1. Security

E-commerce is growing in a global perspective. However, it comes with a risk that some part of the transaction is compromised which may lead to financial loss or unintended shared private information. Therefore, the security of e-commerce transactions is a critical part of the ongoing success and growth of e-commerce [43].

In terms of secure servers[5]; the developing and transition countries have not yet developed the technological infrastructure to compete with the most developed countries in terms of e-commerce [4]. For example, in Iraq, as of 2011, the number of secure Internet servers was just four [34].

E-commerce security requirements can be studied by examining the overall process, beginning with the consumer and ending with the commerce server. Here are some of the most prevailing security attacks [27]:

- *Active Content*: Active content refers to programs that are embedded transparently in web pages and that cause action to occur. These programs can display moving graphics, download and play audio, or implement web-based spreadsheet programs. Anyone can embed malicious active content in web pages. This delivery technique, which is called a Trojan horse, immediately begins executing and taking actions that cause harm.
- *Malicious Codes:* These include computer viruses, worms and Trojan horses A Trojan horse is a program which performs a useful function, but performs an unexpected action as well. Virus is a code segment which replicates by attaching copies to existing executable files. A worm is a program which replicates itself and causes execution of the new copy.
- *Server-Side Masquerading*: Masquerading lures a victim into believing that the entity with which it is communicating is a different entity.
- *Communication Channel Threats*: These are the threats that messages experience on the Internet travel from a source node to a destination node through a number of intermediate computers on the network, as it is impossible to guarantee that every computer on the Internet is safe and secure.
- *Confidentiality Threats*: These are threats to confidentiality, which is the prevention of unauthorized disclosure of information.
- *Integrity Threats*: An integrity threat happens when an unauthorized party can alter a message stream of information.

[3] www.hrej.com
[4] www.mredy.com

[5] Secure servers are servers using encryption technology in Internet transactions.

- *Availability Threats*: The purpose of is type of threats is to disrupt normal computer processing or to deny processing in entire.
- *Server Threats*: This type of threats can cause destruction to the server or to illegally acquire information.
- *Database Threats*: These are the threats that include obtaining user authentication information (username/password pair) which are usually stored in database, then masquerading as a legitimate database user to reveal private and costly information.
- *Common Gateway Interface Threats*: A common gateway interface CGI (which transfers information from a web-server to another program, such as a database program) and the programs to which they transfer data provide active content to web pages.
- *Password Hacking*: The simplest attack against a password-based system is to guess passwords. The attacker can use the password hacked to access the system.

It is possible to overcome the issue of security and confidentiality of data by adopting specific security measures such as encryption, Secure Socket Layer (SSL) Certificates, Certificates with Extended Authentication Validation (EV) and Trustmark [6].

2. Privacy

Privacy now is an integral part of any e-commerce strategy and investment in privacy protection has been shown to increase customer's spend, trustworthiness and loyalty. It has become a major concern for customers especially with the rise of identity theft and impersonation, and any concern for customers must be dealt with as a major concern for e-commerce providers themselves [26].

The combination of current business practices, consumer fears, and media pressure has resulted in making privacy a possible problem for e-commerce [1].

3. Integrity, Authentication & Non-Repudiation

In any e-commerce system, factors such as data integrity, customer & client authentication and non-repudiation are critical to the success of that online business [26].

- *Data integrity*: It is the assurance that data transmitted is consistent and correct and that it has not been altered in any way during its transmission.
- *Authentication*: It is a means by which both parties in an online transaction can be confident that they are who they say they are.
- *Non-repudiation*: It is the idea that no party can dispute that an actual event online took place. It prevents the sender of a message from subsequently denying that he/she sent the message.

These three types of concern have led to the need for the development of strong verification and security measurements such as public key infrastructures (PKI) and digital signatures.

4. Trust

Confidence and trust is an essential requirement for secure electronic trading. The geographical separation of buyers and sellers creates a strong impediment to e-commerce adoption.

E-commerce is directly affected as consumers are still wary of providing their personal and financial details to an online store in case a breach occurs of their data. Studies have showed that consumers are wary of purchasing online and one such study in 2005 of 5,000 Internet consumers came to the conclusion that 32% are more cautious when they shop online, and 14% buy fewer items because of security concerns [43].

Studies, such as [23], have found that knowledge and skills obtained through using the Internet and computer helps to lessen consumers' perceived risk in on-line shopping. The same previous study states that knowledge, risk perception and trust are important factors that affect users' e-commerce adoption in the Arab countries, with knowledge being the most important factor among all these factors.

For [6], they found that trust is a key factor in affecting the perception toward e-commerce adoption and that good security associated with good trust will ultimately lead to increase the adoption of e-commerce in the Arab world.

5. Social Engineering

Social engineering is the art of using people into performing actions for the sake of divulging confidential information. Techniques of social engineering include pretexting (where the fraudster creates an invented scenario to get the victim to divulge information), Interactive voice recording (IVR) or phone phishing (where the fraudster gets the victim to divulge important information over the phone) and

baiting with Trojans horses (where the fraudster 'baits' the victim to load malware unto a system) [26].

V. CONCLUSIONS AND RECOMMENDATIONS

Our findings show that the main barriers to e-commerce adoption in Iraq are the technical, social and cultural, social and economic, social and psychological, political and legal, consumer awareness, local market size and lack of certificate authority issues, in addition to global issues such security, privacy, trust etc.

Unless the policy makers in Iraq and corporate leaders understand and address the various unique issues that pertain to the country, and relate to off-site transactional process, the large scale diffusion and success of such endeavors will be greatly impeded.

Some experts predict that it will be increasingly difficult for smaller businesses to maintain their existence. We cannot avoid coming to a conclusion that there are huge possibilities for e-commerce and it will certainly increase exponentially.

The future growth of e-commerce will be driven by the diffusion of the Internet from developed to developing countries and from large corporations to Small and Medium Enterprises (SMEs). E-commerce revenues will grow and the internet will truly become the World Wide Web as more countries, SMEs, and consumers gain access to reliable internet connections through services such as broadband cable and DSL technologies.

The private sector should play the lead role in the development and use of e-commerce. However; the government can play an important role in encouraging e-commerce growth through taking measures such as the creation of a favorable policy environment for e-commerce and becoming a leading-edge user of e-commerce and its various applications.

As a case study, the US government (during 1998-2000) has adopted a number of policy prescriptions to encourage e-commerce growth in the country. The procedures included demanding the World Trade Organization to declare the Internet to be a tax-free environment, recommending that no new tax policies be imposed on Internet commerce, stating that nations develop a "uniform commercial code" for electronic commerce, requesting that intellectual property protection be consistent and enforceable, that nations adhere to international agreements to protect the security and privacy of Internet commercial transactions, that governments and businesses cooperate to develop and expand the infrastructure of the Internet; and that businesses should self-regulate e-commerce content [11].

ICT has the potential to accelerate economic development in Iraq. To promote ICT services in the Arab world (including Iraq), a number of measures must be adopted by the government [24]:

- Consolidating economic growth by facilitating the generation or increase of another sources of income and investment.
- Enhancing employment opportunities.
- Improving the knowledge-based economy.
- Promoting the degree and the efficiency of the work organization.
- Accelerating the catching-up effect. The diffusion of ICT can be used to accelerate and facilitate efforts to bridge the gap with the advanced countries.
- Minimizing poverty in the region by creating additional employment opportunities.
- Advancing R&D efforts.
- Insuring gender equality in the region.
- Promoting e-commerce. Investments in ICT have the potential to enhance e-commerce.

Among the public policy issues in e-commerce that the government should take care of are:

- *Promoting Access to Inexpensive and Easy Access to Information Networks*: The ultimate goal of the government should be provide a universal access or widespread access to reliable information and communication services at a reasonable cost and its availability at a reasonable distance. Government policies should encourage open access, open architecture and flexible access.
- *Legal Structure*: Preparing a legal environment dealing with the Internet, including issuing appropriate e-commerce laws such as the digital signature, the digital identity, tax treatment, consumer protection, etc. [2].
- *The Protection of Consumers from Fraud*: This will prevent from stealing credit card information to credit under false identity.
- *The Protection of Consumers' right to privacy*: Privacy entails that information must be kept from unauthorized parties.
- *The Legal Protection against Hacking*: Hacking includes gaining unauthorized access to sensitive information.

- *The Protection of Intellectual Property*: This includes the protection of copyrights for literary, musical, dramatic, and artistic works, as well as of sound recordings, films, broadcasts, and cable programs. It also includes the protection of trademarks, as domain names may be seen as a variation of such. Finally, protecting patents in e-commerce settings is also an issue [19].
- *Quality and Speed of Distribution Logistics*: Poor roads and bridges, inefficient transportation systems, coupled with the high cost of international parcel services are major obstacles in the adoption of e-commerce in Iraq. The Government should therefore create a policy environment that encourages investments in the national existing transportation infrastructure and provides for electronic customs clearance processing to streamline the bureaucracy and allow for more transparent, predictable and efficient customs operations.
- *Awareness Campaign*: The government and private sector large corporations can engage in a campaign to publicize information to people and merchants about e-commerce benefits, best practices, success stories, and opportunities and obstacles relating to the use of e-commerce and ICTs. These campaigns could include free-training courses and workshops on e-commerce, security and privacy in addition to awards programs.
- *Computer Labs:* Government initiatives, which include computer laboratory installations in schools, are highly desirable.
- *IT Staff Preparation*: Structuring and implementing integrated educational and training plans that aim to prepare a qualified technical workforce that is capable of developing and running Internet applications [2].
- *E-Government*: the government should be the lead-user of e-commerce in order for various business and private-sector related activities are to be prompted to move online. In effect, the government will have a positive influence.
- *Network Infrastructure and Localization of Content:* An important strategy in this regard is the establishment of "telecenters" or electronic community centers that would work as a community-shared access and connectivity platform, especially in rural areas (for example constructing an electronic agri-information center that provides market information to farmers). These telecenters can also be a venue for capacity building, skills enhancement, training, communications and content development.
- *The Individual Credit System Project:* (resembling social security numbers in the U.S.) should be adopted by the Iraqi government, where every Iraqi citizen obtains a unique identifier. This number is placed in a computer database that serves as a nationwide demographic information repository.
- *Strengthening Consumer Protection:* The government should consider: where and how payment takes place, when settlement takes place, who settles, whether the transaction is B2B or B2C and whether settlement can be traced. The government can also undertake procedures to ensure security in e-commerce transactions by the establishment of a Certification Authority CA (which verifies seller and buyer identities), examines transactions and security procedures, and issues digital certificates to those who are able to meet the set security standards. The government can also design and establish a legal and judiciary framework that provides for minimum standards of and requirements for transparency, impartiality and timeliness.
- *Human Resources Development:* The government can initiate pilot projects and programs for capability-building, training and e-commerce support services, such as Web design.

VI. LIMITATION OF STUDY AND FUTURE WORK

One limitation of this study is the lack of literature on the adoption of e-commerce in Iraq markets. However, we tried to do our best to make use of the available online resources (although, sometimes their values were not identical since these are only estimates), in addition to the use of studies focusing on the Arab land and studies on developing countries. Also, the study had lacked some important data gathering techniques, such as surveys and questionnaires, due to difficulties encircling conducting such types of studies.

While the current study relied mainly on online resources, further research should consider conducting field techniques, such as interviewing students, managers or employees and record their opinions towards a number of issues such as online transactions.

Further studies can also investigate the relationship between the use of ICT and e-commerce and how IT technologies can help promote the use of e-commerce in Iraq.

For policy makers and corporate leaders, this study gives insights as to why Iraq is so far from a real implementation of e-commerce. By understanding the reasons behind non-adoption, appropriate procedures and incentives system can be better provided to encourage e-commerce adoption. Further, the ranking of issues enables potential adopters to focus their attention on important problems.

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